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PATENT APPLICATION

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Laurence M. Hubby, Jr.

Confirmation No.: 9228

Application No.: 09/838,235

Examiner: George Wang

Filing Date: 4/20/2001

Group Art Unit: 2871

Title: FIBER FACEPLATE SUSPENDED PARTICLE DISPLAY

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 6/17/2005.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

() (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

() one month	\$120.00
() two months	\$450.00
() three months	\$1020.00
() four months	\$1590.00

() The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of \$500.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Number of pages: 21

Typed Name: Hugh P. Gortler

Signature: 

Rev 12/04 (Addl brief)

Respectfully submitted,

Laurence M. Hubby, Jr.

By

Hugh P. Gortler

Attorney/Agent for Applicant(s)
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Date: 7/13/2005

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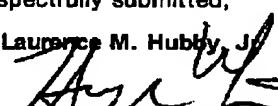
Number of pages: 21

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Rev 12/04 (ApBrief)

Respectfully submitted,



By


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Attorney/Agent for Applicant(s)

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Patent
Docket No. 10007342-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

APPEAL NO. _____

In re Application of:
Laurence M. Hubby, Jr

Serial No. 09/838,235
Filed: April 20, 2001

Confirmation No. 9228
Examiner: George Wang
Art Unit: 2871

For: FIBER FACEPLATE SUSPENDED PARTICLE DISPLAY

APPEAL BRIEF

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office on July 13, 2005.

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1. REAL PARTY IN INTEREST

The real party in interest is the assignee, Hewlett-Packard Development Company.

2. RELATED APPEALS AND INTERFERENCES

No appeals or interferences are known to have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

Claims 1-15 and 21-26 are pending.

Claims 1-15 and 21-26 are rejected.

The rejections of claims 1-15 and 21-26 are being appealed.

4. STATUS OF AMENDMENTS

No amendment was filed subsequent to final rejection.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention addresses a problem with LCD displays in combination with fiber-optic faceplates. A fiber-optic faceplate allows ambient light to illuminate an LCD at a wider range of incident angles (see page 1, lines 15-17 of the application). However, polarizers are needed to prevent a loss in light due to depolarization (page 1, lines 18-27).

Although the polarizers help prevent the loss in light, they create other problems. The application discusses these problems in connection with the prior art display illustrated in Figure 1 of the application (see page 1, line 9 to page 2, line 12). In this prior art display, polarizers must be placed internal to liquid crystal cells. The polarizers must be able to withstand subsequent processing of the LCD

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(e.g., high temperatures when polyamide alignment layers are cured). Polarizers that can withstand the processing typically have poor transmission and low dichromic ratio.

The problems with polarizers are overcome by the display of claim 11, the display of claim 21, and the apparatus of claim 25

Independent claim 11

Reference is made to 3 of the application. Claim 11 recites a visual image display comprising a fiber-optical faceplate, a layer (224) underneath the faceplate (119), and a pair of electrodes (228a and 228b) positioned in contact with opposite surfaces of the layer (224). The faceplate (119) is described at page 7, lines 19-28. The electrodes (228a and 228b) are described from at page 8, lines 4-10.

As illustrated in Figures 2a-2b, the layer (224) includes a liquid light valve suspension (226) and particles (233) suspended in droplets (226) of the liquid light valve suspension. The particles (233) are capable of absorbing or reflecting light. Orientations of the particles (233) depend on an application of an electric field to the electrodes (228a and 228b). Figure 2a shows the particles (233) in an orientation that blocks light, and Figure 2b shows the particles (233) in an orientation that allows light to pass. The layer (224) is described in detail from page 4, line 4 to page 7, line 10 of the application.

As recited in claim 11, the display contains no polarizers. Thus, the problems with polarizers are overcome. Yet the display of claim 11 offers the same benefits as the prior art display of Figure 1 (some of the benefits are listed on page 7, lines 11-18 of the application).

Independent claim 21

Claim 21 recites a visual image display comprising a fiber-optic faceplate; and a suspended particle device light valve in optical communication with the fiber optic faceplate. The light valve includes a plurality of particles in a suspension medium. Referring to the embodiment illustrated in Figure 3, the faceplate is referenced by numeral 119, and the suspended particle device is referenced by numeral 224. Referring to Figures 2a-2b, the suspension medium is referenced by numeral 226, and the particles are referenced by numeral 233. The faceplate (119) is described at page 7, lines 19-28. The suspended particle device (SPD) light valve (224) is described in detail from page 4, line 4 to page 7, line 10 of the application.

Independent claim 25

Claim 25 recites apparatus comprising a substrate; a color filter on the substrate; a suspended particle device on the color filter; and a fiber-optic faceplate on the suspended particle device. Referring to Figure 3, the substrate is referenced by numeral 107, the color filer is referenced by numeral 307, the suspended particle device (SPD) is referenced by numeral 224, and the faceplate is referenced by numeral 119. The faceplate (119) is described at page 7, lines 19-28. The suspended particle device (SPD) light valve (224) is described in detail from page 4, line 4 to page 7, line 10 of the application. The color filters (307) are described at page 9, lines 11-12. The substrate 107 is described at page 6, line 21.

The display of claim 21 and the apparatus of claim 25 do not need polarizers. Yet they offers the same benefits as the prior art LCD display of Figure 1 (which needs polarizers to prevent a loss in light due to depolarization).

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Another advantage of the displays of claims 11 and 21 and the apparatus of claim 25 is that alignment layers are not needed on the fiber-optic faceplate (see page 3, lines 22-24). Thus, there can be small amounts of relative motion between the faceplate and an underlying substrate. This allows resilient perimeter seals to be used.

Dependent claim 3

Claim 3, which depends indirectly from claim 21, recites resilient perimeter seals at both ends of the layer (224). The resilient seals are referenced by numeral 309 in Figure 3 and described at page 9, lines 5-10.

Dependent claim 12

Claim 12 recites the visual image display of claim 11, further comprising resilient perimeter seals at both ends of the layer (224). The resilient seals are referenced by numeral 309 in Figure 3 and described at page 9, lines 5-10.

Dependent claim 26

Claim 26 recites the apparatus of claim 25, further comprising means for sealing the suspended particle device (224) to the faceplate. The sealing means allows motion of the faceplate relative to the suspended particle device. The sealing means is referenced by numeral 309 in Figure 3 and described at page 9, lines 5-10.

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6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- a. Claims 1-14 and 21-23 are rejected under 35 U.S.C. §103 as being unpatentable over Check U.S. Patent No. 5,463,491 in view of Silverstein U.S. Patent No. 6,339,463.
- b. Claims 25-26 are rejected under 35 U.S.C. §103 as being unpatentable over Check U.S. Patent No. 5,463,491 in view of Ishii U.S. Patent No. 5,148,297.

7. ARGUMENTS

In the application, the applicant describes a problem involving liquid crystal displays and offers a solution for overcoming the problem. The documents made of record, do not identify the problem, offer a solution to the problem, or describe a structure that avoids the problem.

The documents made of record do not provide evidence of obviousness. In place of evidence, the examiner offers unsubstantiated allegations.

An examiner's unsubstantiated allegations with respect to knowledge in the prior art does not provide evidence of suggestion, particularly in light of a challenge. See In re Ahlert, 424 F2d.,1088, 1091-92 165 USPQ 418, 420-421 (CCPA1970). The examiner's unsubstantiated allegations were challenged in responses to previous office actions. The examiner was requested to cite a document or provide an affidavit in support of his allegations. Instead of responding to this request, the examiner offered more unsubstantiated allegations.

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**REJECTION OF INDEPENDENT CLAIMS 11 AND 21 UNDER 35 U.S.C 103(a)
OVER CHECK U.S. PATENT NO. 5,463,491 IN VIEW OF SILVERSTEIN
6,339,463**

Check and Silverstein do not teach or suggest the use of an SPD light valve in combination with a fiber-optic face plate.

Check discloses an SPD film suitable for use as a light modulating unit of an SPD light valve. Check does not disclose a fiber-optic face plate. This fact is acknowledged by the office action.

Silverstein discloses a fiber-optic faceplate in combination with a liquid crystal display (LCD). Silverstein does not explicitly disclose that a fiber-optic face plate can be used in combination with an SPD light valve.

In the latest office action, the examiner argues that Silverstein's LC material can be considered particles suspended in suspension, and cites Figures 4-5 of Silverstein. However, Silverstein's description of Figures 4-5 does not support the examiner's allegation (col. 2, lines 15-19 describes droplets of LC material dispersed in an isotropic polymer). Thus, the allegation is unsubstantiated. In addition, the unsubstantiated allegation was previously challenged (in the last response, the examiner was challenged to provide support in the prior art, either by citing a document or by submitting an affidavit pursuant to MPEP §707 and 37 CFR §1.104(d)(2)).

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On page 8 of the latest office action, the examiner offers unsubstantiated allegation in an attempt to support his previously unsubstantiated allegations. He states "there is nothing that distinguishes a suspended particle device from that of an LCD." He also states it is well known in the art at LC molecules are particles that are suspended within an LC layer. The examiner cites no documents to support either allegation. Moreover, the examiner ignores the teachings of the application, which differentiates between LCDs and suspended particle devices.

Second, the unsubstantiated allegation is somewhat puzzling. Substituting the unsubstantiated allegation for evidence, the basis for rejection should have been section 102, not section '103.

The office action also argues that the combined teachings of Check and Silverstein provide reason for combining a fiber-optic faceplate with the layer recited in claim 21. The office action argues that it would be obvious "to adapt the fiber-optic faceplate as disclosed by Silverstein to the device of Check to enhance light collection efficiency and viewing angle performance." Although the office action does not describe exactly how the faceplate would be adapted, the following is presumed: the office action argues it would be obvious to cherry-pick Silverstein's fiber optic-faceplate only and add it to Check's SPD light valve.

The office action engages in impermissible hindsight reconstruction. It uses the applicant's structure as a template and selecting elements from references to fill the gaps. The office action finds no desirability in the prior art for combining a fiber-optic faceplate with an SPD light valve.

The office action cites a paragraph at col. 3, lines 22-37 of Silverstein. However, that paragraph discloses the deficiencies of monochrome reflective

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displays that operate on Bragg's principle (see lines 30-34), and how a fiber optic faceplate, in combination with such displays, offers benefits. One benefit is greater brightness.

However, an SPD without faceplate already possesses this benefit. The suspended particle device without a faceplate is potentially quite bright. Moreover, neither Check nor Silverstein teach or suggest that an SPD light valve has the same deficiencies as a Bragg-diffracting LCD. Hence, the cited documents provide no reason, incentive or motivation to add a fiber faceplate to an SPD light valve.

The applicant gives a reason for combining a fiber-optic faceplate with an SPD light valve: polarizers can be eliminated. Eliminating the polarizers is desirable, since the polarizers are difficult to build, typically have poor transmission and low dichromic ratio, etc. Thus, a problem with faceplate-LCD displays is overcome.

Claim 21 recites a visual image display comprising a fiber-optic faceplate; and a suspended particle device (SPD) light valve in optical communication with the fiber optic faceplate. The combination of Check and Silverstein does not give reason, incentive or motivation for using a fiber-optic face plate in combination with an SPD light valve. Therefore, the '103 rejection of claim 21 and its dependent claims 1-10 and 22-24 should be withdrawn.

Claim 11 recites a visual image display including a fiber-optical faceplate; and a layer underneath the faceplate, wherein the layer includes a liquid light valve suspension and particles suspended in droplets of the liquid light valve suspension, wherein the particles are capable of absorbing or reflecting light.

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The display contains no polarizers. As discussed above, Silverstein and Check do not teach or suggest such a display. Therefore, claim 11 and its dependent claims 12-15 should be allowed over the combination of Check and Silverstein.

II

**REJECTION OF DEPENDENT CLAIMS 3 AND 12 UNDER 35 U.S.C 103(a)
OVER CHECK U.S. PATENT NO. 5,463,491 IN VIEW OF SILVERSTEIN U.S.
PATENT NO. 6,339,463**

Check and Silverstein are silent about the relative amount of motion between a fiber-optic faceplate and an underlying substrate. The record offers no evidence that the use of resilient seals is obvious. The examiner substitutes unsubstantiated allegations for evidence.

The office action cites Figure 6, element 15 of Check. However, Figure 6 doesn't show an element 15. Figure 1 shows element 15 as a spacer, and col. 10, lines 20-33 only states that the spacer 15 is sealed to glass plates (line 26).

Thus, the examiner has no basis to conclude that the use of a resilient seal is obvious. For this additional reason, claims 3 and 12 should be allowed over the combination of Check and Silverstein.

III

**REJECTION OF INDEPENDENT CLAIM 25 UNDER 35 U.S.C 103(a) OVER
CHECK U.S. PATENT NO. 5,463,491 IN VIEW OF ISHII U.S. PATENT NO.
5,148,297**

Claim 25 recites apparatus including a substrate, a color filter on the substrate, a suspended particle device on the color filter; and a fiber-optic faceplate on the suspended particle device. The office action acknowledges that Check does not disclose either the color filter or the fiber-optic faceplate.

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The office action contends that Ishii suggests adding a color filter and fiber optic faceplate to Check's display. However, Ishii does not explicitly disclose this. Moreover, the office action makes no attempt to substantiate its contention. It does not even attempt to find reason, incentive or motivation in the prior art for adding Ishii's faceplate and color filter to Check's SPD-based display. The office action cites a passage at column 4, lines 46-51 of Ishii. However, the relevance of this passage is not clear, since it simply states a purported advantage of Ishii's system.

Once again, the office action engages in impermissible hindsight reconstruction. It uses the applicant's structure as a template and selecting elements from references to fill the gaps.

The evidence made of record does not teach or suggest the apparatus of claim 25. Therefore, claim 25 and its dependent claim 26 should be allowed over the combination of Check and Ishii.

IV

REJECTION OF DEPENDENT CLAIM 26 UNDER 35 U.S.C 103(a) OVER CHECK U.S. PATENT NO. 5,463,491 IN VIEW OF ISHII U.S. PATENT NO. 5,148,297

Claim 26 recites means for sealing the suspended particle device to the faceplate, the means allowing motion of the faceplate relative to the suspended particle device. Check does not disclose a means for sealing a fiber-optic faceplate to an SPD light valve. Ishii shows a sealing compound (12) for sealing a fiber plate 16 to liquid crystal layers 13a, 13b.

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The office action states "depending upon the viscosity, hence flexibility of the sealing compound, it will allow motion of the faceplate relative to the suspended particle device." The statement is pure fabrication by the examiner. The statement is nowhere to be found in Ishii. Ishii is silent about the flexibility of the sealing compound as well as the relative motion between the fiber plate 16 and the liquid crystal layers 13a, 13b.

The office action cites a passage at col. 3, lines 62-67, but the relevance of this passage is not clear. On page 9 of the latest office action, the examiner states that obviousness of claim 26 is clear from this passage, but this passage provides no facts to support the allegation. This unsubstantiated allegation has already been challenged.

Thus, the evidence presented in Check and Ishii does not teach or suggest the sealing means of claim 25. For this additional reason, claim 26 should be allowed over the combination of Check and Ishii.

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For the reasons above, all pending claims should be allowed over the documents made of record. The Honorable Board of Patent Appeals and Interferences is respectfully requested to reverse the '103 rejections.

Respectfully submitted,

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Date: July 13, 2005

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8. CLAIMS APPENDIX

1. (Previously presented) The display of claim 21, wherein:
the fiber-optic faceplate includes:
 - an upper face;
 - a lower face; and
 - a multiplicity of straight optical fibers positioned between the upper face and the lower face of the faceplate;
wherein longitudinal axes of the optical fibers are parallel to each other and substantially perpendicular to the upper face and the lower face of the faceplate; and
wherein each of the fibers collects and projects through the faceplate a plurality of light rays emitted by an ambient light source; and
the suspended particle device (SPD) further includes:
 - a pair of electrodes on opposite surfaces of a layer of the SPD, wherein orientations of the particles depend on an application of an electric field to the electrodes.
2. (Original) The visual image display of claim 1, further comprising a transparent conductive layer coated underneath the lower face of the faceplate and on top of the layer of SPD.
3. (Previously presented) The visual image display of claim 1, further comprising resilient perimeter seals at both ends of the layer of SPD.

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4. (Original) The visual image display of claim 1, wherein the particles align in the direction of the electric field when the electric field is applied, whereby the layer of the SPD becomes substantially transparent to the plurality of light rays.

5. (Original) The visual image display of claim 1, wherein particles randomize when the electric field is removed, whereby the layer of the SPD becomes substantially opaque.

6. (Original) The visual image display of claim 1, further comprising color filters positioned on a rear substrate to produce a color display, wherein the rear substrate is positioned underneath the layer of the SPD.

7. (Original) The visual image display of claim 1, wherein the fiber-optic faceplate is formed to a thickness within the range of approximately 0.25 to 5.0 millimeters.

8. (Original) The visual image display of claim 1, wherein the layer of SPD comprises a layer of SPD fluid.

9. (Original) The visual image display of claim 1, wherein the layer of SPD comprises a layer of SPD film.

10. (Original) The visual image display of claim 9, further comprising a thin layer of index matching fluid positioned on top of the layer of SPD film.

11. (Previously presented) A visual image display, comprising:

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a fiber-optical faceplate;
a layer underneath the faceplate, wherein the layer includes a liquid light valve suspension and particles suspended in droplets of the liquid light valve suspension, wherein the particles are capable of absorbing or reflecting light; and
a pair of electrodes positioned in contact with opposite surfaces of the layer;
wherein orientations of the particles depend on an application of an electric field to the electrodes; and
wherein the display contains no polarizers.

12. (Previously presented) The visual image display of claim 11, further comprising resilient perimeter seals at both ends of the layer.

13. (Previously presented) The visual image display of claim 11, wherein the particles align in the direction of the electric field when the electric field is applied, whereby the layer becomes substantially transparent to the light.

14. (Previously presented) The visual image display of claim 11, wherein particles randomize when the electric field is removed, whereby the layer becomes substantially opaque.

15. (Previously presented) The visual image display of claim 11, further comprising a substrate and color filters positioned on the substrate to produce a color display, wherein the substrate is underneath the layer.

Claims 16-20 (Cancelled).

21. (Previously presented) A visual image display comprising:

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a fiber-optic faceplate; and
a suspended particle device light valve in optical communication with the fiber optic faceplate, the light valve including a plurality of particles in a suspension medium.

22. (Previously presented) The display of claim 21, wherein the light valve further includes first and second electrodes, the suspension medium between the first and second electrodes.

23. (Previously presented) The display of claim 21, further comprising a substrate, the light valve sandwiched between the faceplate and the substrate; wherein no polarizer is between the light valve and the faceplate.

24. (Previously presented) The display of claim 21, further comprising a color filter positioned adjacent the suspended particle device.

25. (Previously presented) Apparatus comprising:
a substrate;
a color filter on the substrate;
a suspended particle device on the color filter; and
a fiber-optic faceplate on the suspended particle device.

26. (Previously presented) The apparatus of claim 25, further comprising means for sealing the suspended particle device to the faceplate, the means allowing motion of the faceplate relative to the suspended particle device.

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